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WORK PROJECT REQUEST

9.	Project Title Tradeoff Studies for Recycle Economics
•	SUMMARY OF ESTIMATES
	Effort \$ 145,000 M&S \$ 5,000 Total \$ 150,000
	Total \$ 150,000 Cost Centers charging Effort
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	107
10.	JUSTIFICATION (Explain program or service need, the inadequacy of present facilities, urgency and programmatic consequences if project is not authorized.)
	Both the Advanced Fuel Cycle Initiative (AFCI) and the Generation IV Program within DOE-NE support recycle of spent nuclear fuel. New recycle technologies are being pursued to create more proliferation resistant processes and to produce fuels that can be used for the destruction of significant quantities of plutonium in existing spent fuel.
	The major impediment to the widespread deployment of fuel recycle is economics. Direct disposal of spent fuel is less costly than recycle using established technologies. Deployment of new technologies will have to be performed in a manner that makes economic sense in addition to meeting the earlier goals. Research to determine the key cost elements for recycle and then assessments of the impacts of advanced technologies on these cost elements are needed.
	The advanced nuclear fuel cycle initiative is expected to set the course for Argonne's nuclear energy program for the next decade. The deployment plans for a recycle facility would focus that work and provide direction for a national effort.
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	Continue on separate page(s) as necessary
1.	DIVISIONAL REVIEW AND APPROVAL
	Signature : Date
	1) Feasibility and/or Justification Stephen & Johnson Ly. H. McFalant 12/9/02
,	2) Adequacy of Budget Left R. Shellow 12/9/07
	3) Division Director's Approval

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9.	Project Title Strategic Analysis of Recycle Technologies	Deployment
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	Cost Centers charging Effort	
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10.		nadequacy of present facilities, urgency and programmatic consequence
	advanced proliferation-resistant nuclear fuel cycle. Both the within DOE-NE support recycle of spent nuclear fuel. New reresistant processes and to produce fuels that can be used for	vanced nuclear fuel cycles. This position was reinforced during the May bunced that Russia and the U.S. would work together in developing an Advanced Fuel Cycle Initiative (AFCI) and the Generation IV Program ecycle technologies are being pursued to create more proliferation or the destruction of significant quantities of plutonium in existing spent fue
	The advanced nuclear fuel cycle initiative is expected to set The deployment plans for a recycle facility would focus that v	the course for Argonne's nuclear energy program for the next decade. ork and provide direction for a national effort.
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1	2) Adequacy of Budget	R. Shellon 12/9/02
	3) Division Director's Approval	Russon Lon H. M. Farlance 12/9/02

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WORK PROJECT REQUEST PROJECT TITLE Remote Fuel Fab Technology SUMMARY OF ESTIMATES Effort \$205,000 M&S 20.000 Total \$225,000 Cost centers charging effort: cc 122, cc 121, cc 107 **JUSTIFICATION** (Explain program or service need, the inadequacy of present facilities, urgency and programmatic consequences if project is not authorized.) One of the key process functions to be performed in any fuel cycle is fuel fabrication. Some proposed generation IV reactor technological require novel fuel. Some of these novel fuels require large advances in fuel fabrication and process technology. This work will assess fuel and fuel fabrication options that are proposed under ANL initiatives. Evaluation of fabrication options will aid in the formulation of Argonne's Advanced Nuclear Fuel Cycle strategy by putting capital and fuel production costs on a quantitative basis, allowing differentiation between the costs of recently proposed fuel cycle strategies. Fuel fabrication process layouts will aid in preconceptual work for a fuel recycle facility. Differences in proliferation realstance relating to processing of specific fuel types will be identified. The results of the analysis will aid ANL in selection of preferred technology options for an advanced nuclear fuel cycle. This strategy will result in a self-consistent and carefully justified choice of an optimum fuel cycle and the potential for funding of a larger fuel cycle project. Continue On Separate Page(s) As Necessary

Signature

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DIVISIONAL REVIEW AND APPROVAL

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3) Division Director's Approval

2) Adequacy of Budget

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WORK PROJECT REQUEST

PROJECT TITLE Fuel Development Gas Cooled Reactor

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	Total \$75,000
	Cost centers charging effort; cc122, cc 123
1.	JUSTIFICATION (Explain program or service need, the inadequacy of present facilities, urgency and programmatic consequences if project is not authorized.)
	This project supports the Laboratory's strategic initiative in the area of Advanced Nuclear Fuel Cycle Technology. Fast spectrum gas reactors are a promising future application of nuclear technology due to the potential for high fuel utilization and waste transmutation. Development of fuels for such a system is challenging due to the high temperatures required for efficient gas turbine power cycles and vary high temperatures which could occur during a rapid depressurization accident with concurrent loss of electric power. The focus of this proposal is on the development of fuels compatible with a closed fuel cycle and a passively safe reactor design.
	Developing this technology benefits ANL by enhancing the Laboratory's capability to develop and test complete advanced fuel cycles
	for a sustainable nuclear future. Successful completion allows advancement of closed fuel cycle technology. Fuels developed may have application to liquid metal cooled systems and could enhance the safety of such systems by providing a wider margin to fuel melting. The primary customer and beneficiary in the short term is the DOE Generation IV International Initiative. Longer-term interest should then develop from the commercial power sector.
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12.	DIVISIONAL REVIEW AND APPROVAL Signature Date
	1) Feasibility and/or Justification /47/bell / / 12/11/07
	2) Adequacy of Budget Rage Culson (2/Mor
	3) Division Director's Approval